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Method and apparatus for the inspection of objects

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P a t e n t   c l a i m s

1. Method for the inspection of objects, such as packs (10), with respect to the proper positioning of blanks (12, 17) placed on them, such as labels, in particular for inspecting the proper arrangement of band strips (12) on cigarette packs (10), with the objects (10) being moved past an inspection means (39) and illuminated by one or more illuminating means (41, 42) in the region of the inspection means (39) and with the positioning being identified on the basis of border edges (20, 22) of the blank (12, 17),  
5 **characterized in that** the blank (12, 17) is illuminated laterally at one or more of its border edges (20, 22) while the inspection means (39) scans the blank (12, 17) from an essentially frontal aspect.
- 10 2. Method according to Claim 1, **characterized in that** when an object has reached an inspection position, a trigger sensor (46) generates a trigger signal which turns on the illumination means (41, 42) and/or causes a snapshot of the object (10) to be made by the inspection means (39).
- 15 3. Method according to Claim 1, **characterized in that** that a plurality of evaluation windows (49A-D) within the image captured by the inspection means (39) during the snapshot are evaluated for differences in brightness in order to obtain precise positions of the border edges (20, 22), with the evaluation windows (49A-D) being selected in the

region of the expected border edge positions and/or in the region of a reference position of a pocket (34) for receiving an object (10).

4. Method according to Claim 1, **characterized in that** the width as well as the position of a band strip (12) are evaluated with respect to its centered position relative to the pack (10) and/or to any skewed position.

5. Apparatus for the inspection of objects, such as packs (10), with respect to the proper positioning of blanks (12, 17) placed on them, such as labels, in particular for inspecting the proper arrangement of band strips (12) on cigarette packs (10), with an inspection means (39) and one or more illumination means (41, 42) in the region of a conveying path (35) of the objects (10), with the inspection means (39) identifying the positioning on the basis of border edges (20, 22) of the blank (12, 17), **characterized in that** the main direction of illumination (44, 45) of each illumination means (41, 42) is directed at one or more border edges (20, 22) and the main line of sight (43) of the inspection means (39) is directed at the blanks (12, 17) at an essentially frontal aspect.

6. Apparatus according to Claim 5, **characterized in that** that each main direction of illumination (44, 45) assumes an angle of 45° to 90°, in particular 70° to 80°, to the main line of sight (43).

7. Apparatus according to Claim 5, **characterized in that** the illumination means (41, 42) have bright white-light diodes (48).

8. Apparatus according to Claim 5, **characterized in that** the illumination means (41, 42) can be turned on and off in pulsed-mode operation.

9. Apparatus according to Claim 5, **characterized by** a trigger sensor (46) for detecting an inspection position of an object (10) and for generating a trigger signal for turning on the illumination means (41, 42) and/or for generating a snapshot of an object (10) in the inspection position.

10. Apparatus according to Claim 5, **characterized in that** that the inspection means (39) has an electronic camera, in particular a CCD camera, and that predetermined areas, in particular evaluation windows (49A-D), can be selected within the image captured by the camera and evaluated for differences in brightness.

11. Apparatus according to Claim 10, **characterized in that** at least two or three evaluation windows (49A-C) are directed at the border edges (20, 22) of a blank (12, 17)

and that in particular a further evaluation window (49D) is directed at a reference position of a pocket (34) for receiving an object (10).

12. Apparatus according to Claim 5, **characterized by** an arrangement in the region of an open pocket end of a turret, in particular of the drying turret (29), of a cigarette packer (23) and/or in the region of a faulty pack conveyor (32) for the elimination of any faulty packs (35) in the conveying direction upstream of the faulty pack conveyor (32).

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